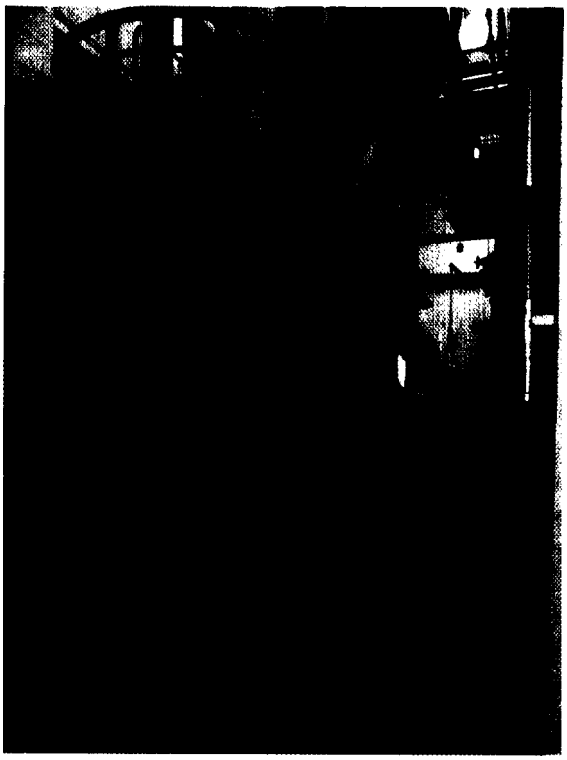
Commendable Practices



During the course of this review, a number of commendable practices were observed at DOE sites, including innovative activities, programs, or management systems that can provide lessons learned related to chemical safety. Such practices represent "pockets of innovation and excellence," and their visibility and application should and will be encouraged throughout the Department. Descriptions of specific commendable practices and the names of site contacts who can provide further information are provided in Appendix O.

Of the commendable practices listed in Table 5, administrative controls and other management systems developed and implemented to reduce hazardous chemical inventories at DOE sites are particularly notable. Some sites visited had expended significant effort to identify surplus hazardous chemicals and to reuse, dispose of, or sell these materials. Some sites have also adopted '(just-in-time" procurement practices to maintain chemical inventories at minimum levels. For example, the Chemical Management System implemented by Pacific Northwest Laboratory at Hanford Site is a model chemical inventory control program. This computer-based chemical inventory system is used to inventory chemicals, provide hazard information about individual chemicals, and minimize chemical waste. The Chemical Management System has been in use since November 1991 and was designated as an outstanding model by the Office of Environment, Safety and Health. Pacific Northwest Laboratory is working with Brookhaven to establish a comparable system; the National Renewable Energy Laboratory and Lawrence Berkeley Laboratory have requested assistance in developing similar programs; and Argonne National Laboratory–West has adapted basic concepts from the Chemical Management System to improve its use of material safety data sheets.

The maturation and effectiveness of industrial hygiene programs addressing operations and nonroutine work controls for hazardous chemicals were also notable. For example, Argonne–West has an exemplary chemical hygiene program that meets and exceeds the requirements of the OSHA Laboratory Standard (29 CFR 191 0.1450), the OSHA Hazard Communication (HAZCOM) Standard (29 CFR 1910.1200), and DOE 5480.10, "Contractor Industrial Hygiene Program." Chemical hygiene personnel have taken a proactive approach for implementing this program. The storage, labeling, and administrative

Table 5. **Commendable Practices Addressing Elements of Generic Vulnerabilities**

GENERIC VULNERABILITY	COMMENDABLE PRACTICE
CHARACTERIZATION OF CHEMICALS	– Facilities Space Management Program (Sandia)
UNANALYZED HAZARDS	– Evaluating and Reducing Hazards During Life Cycle of Operations (Oak Ridge) – Applying Graded Approach to Hazards Analysis (Brookhaven) – Emergency Response Nomograph for Toxic Chemical Spills (Idaho National Engineering Laboratory) – Dispersion Model to Calculate and Display Plume Dispersions (Los Alamos)
PAST CHEMICAL SPILLS	– Documentation of Facility Dismantling (Sandia) – Hazardous Material (Hazmat) Response Team Preparedness fo[Chemical Spills (Los Alamos)
PLANNING FOR DISPOSITION OF CHEMICALS	– Chemical Salvage Program (Savannah River, Lawrence Livermore, Idaho National Engineering Laboratory) – Sitewide Wastewater Discharge Minimization Program (Hanford)
CHEMICAL STORAGE PRACTICES	– Chemical Storage at Analytical Laboratory (Argonne National Laboratory - West)
CONDITION OF FACILITIES AND SAFETY SYSTEMS	– Facilities Space Management Program (Sandia) – Computer-Based Maintenance Control Reporting System (Brookhaven) – Work Control Program for Engineering and Maintenance (Idaho National Engineering Laboratory)
ABANDONED AND RESIDUAL CHEMICALS	– Removing Residual Chemicals From Unused Chemical Process Equipment (Idaho National Engineering Laboratory) – Facilities Space Management Program (Sandia) – Documentation of Facility Dismantling (Sandia)
INVENTORY CONTROL AND TRACKING	– Chemical Management Systems (Hanford, Rocky Flats, Lawrence Livermore, Argonne National Laboratory - West) – Hazardous Waste Labeling System (Los Alamos) – Chlorine and Toxic Gas Control Program (Los Alamos, K-25 Site Rocky Flats, Sandia) – Elimination of chlorine gas in water treatment operations (Savannah River)
MANAGEMENT SYSTEM DEFICIENCIES	– Sharing Chemical Safety Program Information (Savannah River) Participation, Coordination and Cooperation with State Regulatory Agencies (Sandia) – Work Control Program for Engineering and Maintenance (Idaho National Engineering Laboratory) – ES&H Management Assurance Notebooks (Sandia) – Contract Initiative to Ensure Adequate Hazards Communications (Brookhaven)

NOTE: In most cases, the commendable practices listed above address only parl of the corresponding generic vulnerability. Some commendable practices have application for more than one generic vulnerability. See Appendix O for detailed descriptions of these practices.

controls for chemicals are excellent. In particular, the methodology for segregating laboratory chemicals, carcinogens, organics, and other materials is commendable. Using this approach, chemical hygiene personnel at Argonne–West have reduced the inventory of high-risk chemicals such as ethers, benzene, and other organics.

Other commendable practices included efforts to identify and mitigate environmental releases of hazardous chemicals (e.g., the nomograph for toxic chemical spills developed by Westinghouse Idaho Nuclear Company and the chemical plume dispersion model used at Los Alamos).

The implementation of engineered safeguards and controls on chlorine and other toxic gas systems was noted at four locations (Los Alamos, Oak Ridge K-25 Site, Rocky Flats, and Sandia), whereas substituting the use of less hazardous chemicals for that-of more hazardous chemicals was particularly successful in eliminating chlorine gas from water treatment operations at Savannah River.

A model chemical hygiene program was observed at the Argonne–West Analytical Laboratory.

Finally, the space management program developed at Sandia demonstrates the effectiveness of financial incentives (i.e., space charges) in resolving problems associated with hazardous chemical residues. To effect a facility transfer, thereby avoiding space charges, the current user organization must work through the Facilities Center to have the facility evaluated for residual hazards. If hazards are detected, the current user must take remedial action before the Facilities Center will accept the facility. By performing such evaluations before space ownership is transferred, Sandia seeks to avoid the potential exposure of employees moving to new work areas, to decrease physical hazards in the workplace, to expedite remediation of contaminated areas, and to track the presence of chemical and/or radiological residues.